Instantiation of IETF Network Slices in service providers networks

draft-barguil-teas-network-slices-instantation-05

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Context (reminder)

- IETF Network Slice Services:
  - Requirements: draft-ietf-teas-ietf-network-slices and draft-ietf-teas-ietf-network-slice-use-cases
  - Network Slice service framework: draft-ietf-teas-ietf-network-slices
  - Slice attributes and functionalities expected: draft-ietf-teas-ietf-network-slice-use-cases

- IETF Network Automation:
  - Service Models: Capture the customer requirements (i.e. LxSM, ...)
  - Network Models: Capture the Network requirements to deliver a service. (i.e. LxNM)
  - TE Models and Service Mapping: Maps the TE data models and the service/network models.
  - ACLs and Routing Policies

- Existing architectures and frameworks for Network Automation and SDN:
  - [RFC 8969] A Framework for Automating Service and Network Management with YANG
  - [RFC 8453] Framework for Abstraction and Control of TE Networks (ACTN)
  - [RFC 8309] Service Models Explained
Possible architectural options (reminder)

- IETF NSC as a module of the Hierarchical SDN controller
- IETF NSC as a stand-alone entity
- IETF NSC as a module of the Network controller
Updates from -03 version

• -04 (July 2022)
  o Correction of Fig.5 for better showing possible mapping of IETF NS NBI YANG model to either LxSM or LxNM
  o Addition of the description of the relationship between IETF NS NBI model parameters and L2SM ones
  o Moving from annex to the main body the relationship between IETF NS NBI model and LxSM models
  o Fixing of a lot of typos and update of references (from I-D to RFC)

• -05 (October 2022)
  o General alignment with terminology in framework document, update of references (from I-D to RFC) and text refinement
Relationship between models

- Based on RFC 8309 models relationship
- Realization of IETF NS service model could be mapped either to a Service model (e.g., L3SM) or directly to a Network model (e.g., L3NM)
### Relationship between IETF NBI model parameters and LxSM model parameters

<table>
<thead>
<tr>
<th>LxSM (RFC 8289)</th>
<th>LxSM (RFC 8446)</th>
<th>IETF NSC NBI YANG model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bandwidth</td>
<td>Bandwidth (CIR, PIR)</td>
<td>Sum of bandwidth SLO per NSE counting all connections</td>
</tr>
<tr>
<td>MTU (later 3 service)</td>
<td>MTU (later 2 service)</td>
<td>MTU attribute in SLE</td>
</tr>
<tr>
<td>QoS</td>
<td>QoS</td>
<td>QoS</td>
</tr>
<tr>
<td>- QoS classification policy</td>
<td>- QoS classification policy</td>
<td>Defined in the model as network-access-qos-policy-name to be applied per access-point</td>
</tr>
<tr>
<td>- QoS profile</td>
<td>- QoS profile</td>
<td>Defined in the model as incoming/outgoing rate-limits per end-point (or access-point)</td>
</tr>
<tr>
<td>- latency</td>
<td>- latency</td>
<td>One-way / Two-way latency SLO</td>
</tr>
<tr>
<td>- jitter</td>
<td>- jitter</td>
<td>One-way / Two-way delay variation SLO</td>
</tr>
<tr>
<td>- bandwidth</td>
<td>- bandwidth</td>
<td>One-way / Two-way bandwidth SLO</td>
</tr>
<tr>
<td>Multicast</td>
<td>Broadcast, Unknown, Unicast and Multicast (BUM)</td>
<td>The need of replication can be inferred from ns-connectivity-type. Further details are not available (e.g. source or receiver role)</td>
</tr>
<tr>
<td>Availability as dual homing</td>
<td>Availability as the ratio of up-time to total_time(up-time+down-time)</td>
<td></td>
</tr>
</tbody>
</table>

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Next Steps

• Version -06 will provide further updates
  • Review of the architectural models (clean up if needed)
  • Evaluation of a new architectural option where a service model is further mapped/realized to a IETF NS service (e.g., to an OTN slice)

• Relationship of parameters between IETF NS NBI YANG and LxNM

• Keep working on detailing the different implementation options and its operational considerations.

• Collect feedback / comments from the WG to enhance the document.

• Consider request of WG adoption to incorporate the WG view (targeting IETF 116)